

Dear Dr. Sutula:

On behalf of the U.S. Environmental Protection Agency, we are pleased to formally invite you to participate in a regional Numeric Nutrient Criteria Technical Workshop that is being held at EPA's Region 9 office in San Francisco, California, May 1-3, 2018. Given your knowledge and expertise in understanding the physical controls on nutrient cycling and on linking their scientific basis to management we would appreciate your participation on a panel session on "Use and Applicability of Nutrient Models and Other Tools to Address Nutrient Pollution." You will be joined by our state, tribal, federal, and academic colleagues from across EPA Regions 8, 9, and 10 who work directly on numeric nutrient criteria development.

We are convening state, tribal, federal, and academic water quality scientists as a way of better understanding the current state of the scientific knowledge about the environmental impacts of nutrient pollution and to use that knowledge to catalyze future actions that can support state water quality management of nutrient pollution under the Clean Water Act. The goals of the workshop are three-fold: First, we seek to communicate and exchange scientific information on the latest nutrient pollution science and numeric nutrient criteria development activities. Second, we intend for these exchanges to lead to more in-depth technical discussions and experiences in specific issue areas. Third, we are designing the exchanges and discussions to lead to discrete action items that support future state and tribal efforts to develop nutrient criteria.

To achieve these goals, we are planning a range of activities. These include oral presentations by invited speakers, facilitated panel discussions among participants, structured group exercises and discussions, and poster presentations on a variety of nutrient criteria topics. The draft agenda, which is attached, captures these activities and the associated participants. We expect that all invited participants will actively engage with one another, share their experiences working on these issues, and support the development of action items we can pursue together through collaborative efforts.

Therefore, we would appreciate for you to share any information and/or tools relevant or applicable to states and tribes within the Western Region interested in developing nutrient criteria for coastal and estuarine waters. We envision your participation in the aforementioned panel as a way to highlight the pros and cons of the approaches you and/or your colleagues at the Southern California Coastal Water Research Project have used to identify appropriate nutrient thresholds and to compare these with those being used by other researchers in the field. We are inviting Dustin Bilhimer (from Washington Department of Ecology) and Cheryl Brown (from EPA's Office of Research and Development) as fellow panelists for this session given their work in Washington and Oregon. Since our interest is to inform state and tribal water quality scientists in the West Coast of current efforts and alternatives to select endpoints for nutrient criteria development, collect and analyze data that will help them identify nutrient criteria thresholds we would appreciate your insight on how your work may fit and/or inform their needs. Please feel free to let us know, if your research can be used to inform any of the other topics included in our agenda.

Due to resource limitations, we are not able to offer travel support to you. We hope that this constraint will not deter you from participating. However, we are able to include you in a group hotel reservation, which should help in limiting your expenses. In the coming weeks our contractor, Tetra Tech, will contact you to provide additional logistical information. Should you have any questions about your participation or logistics, please do not hesitate to contact either of us.

As a trusted colleague, we appreciate your consideration to participate and look forward to your contributions to these important issues.

Sincerely,

Rochelle Labiosa, Ph.D., U.S. EPA, Region 10, Office of Water and Wetlands, Workshop Co-Chair

Janice Alers-Garcia, Ph.D., U.S. EPA, Office of Water, Office of Science and Technology, Workshop Co-Chair

Dear Dr. Kudela:

On behalf of the U.S. Environmental Protection Agency, we are pleased to formally invite you to participate in a regional Numeric Nutrient Criteria Technical Workshop that is being held at EPA's Region 9 office in San Francisco, California, May 1-3, 2018. You are invited to share your knowledge and expertise in how light, nutrients, and phytoplankton interact and result in the formation of HAB's. You will be joined by our state, tribal, federal, and academic colleagues from across EPA Regions 8, 9, and 10 who work directly on numeric nutrient criteria development.

We are convening state, tribal, federal, and academic water quality scientists as a way of better understanding the current state of the scientific knowledge about the environmental impacts of nutrient pollution and to use that knowledge to catalyze future actions that can support state water quality management of nutrient pollution under the Clean Water Act. The goals of the workshop are three-fold: First, we seek to communicate and exchange scientific information on the latest nutrient pollution science and numeric nutrient criteria development activities. Second, we intend for these exchanges to lead to more in-depth technical discussions and experiences in specific issue areas. Third, we are designing the exchanges and discussions to lead to discrete action items that support future state and tribal efforts to develop nutrient criteria.

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Janice Alers-Garcia, Ph.D., U.S. EPA, Office of Water, Office of Science and Technology, Workshop Co-Chair

| Dear Dr. Senn:

On behalf of the U.S. Environmental Protection Agency, we are pleased to formally invite you to participate in a regional Numeric Nutrient Criteria Technical Workshop that is being held at EPA's Region 9 office in San Francisco, California, May 1-3, 2018. You are invited to share your scientific expertise on nutrient biogeochemistry and experience gained in water resources management while working on the "San Francisco Bay Estuary Efforts to Reduce Nutrient Pollution." You will be joined by our state, tribal, federal, and academic colleagues from across EPA Regions 8, 9, and 10 who work directly on numeric nutrient criteria development.

We are convening state, tribal, federal, and academic water quality scientists as a way of better understanding the current state of the scientific knowledge about the environmental impacts of nutrient pollution and to use that knowledge to catalyze future actions that can support state water quality management of nutrient pollution under the Clean Water Act. The goals of the workshop are three-fold: First, we seek to communicate and exchange scientific information on the latest nutrient pollution science and numeric nutrient criteria development activities. Second, we intend for these exchanges to lead to more in-depth technical discussions and experiences in specific issue areas. Third, we are designing the exchanges and discussions to lead to discrete action items that support future state and tribal efforts to develop nutrient criteria.

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We have organized a special session on estuarine and coastal waters and given your experience as senior scientist and co-director of San Francisco Bay Estuary Institute Clean Water Program Institute we would appreciate to learn about what type of data has been collected for nutrient-related parameters, which tools can be used to measure and visualize nutrient data, and to estimate the changes resulting from nutrient management efforts. We would be particularly interested in learning about the relationships between nutrients/nutrient sources and response parameters in the Bay as these might be able to inform the selection of endpoints and targets for nutrient criteria development, and alternatives to data collection and analysis. We will appreciate your insight on how the work done on San Francisco Bay may inform state and tribal efforts to implement effective nutrient reduction strategies and/or developing numeric nutrient criteria. Please feel free to let us know, if your research can be used to inform any of the other topics included in our agenda.

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Janice Alers-Garcia, Ph.D., U.S. EPA, Office of Water, Office of Science and Technology, Workshop Co-Chair

Dear Dr. Brown:

On behalf of the U.S. Environmental Protection Agency, we are pleased to formally invite you to participate in a regional Numeric Nutrient Criteria Technical Workshop that is being held at EPA's Region 9 office in San Francisco, California, May 1-3, 2018. You are invited to share your scientific expertise on the "Development of Nutrient Criteria Thresholds for Pacific Northwest Estuaries: A Case Study of Yaquina Estuary, Oregon." You will be joined by our state, tribal, federal, and academic colleagues from across EPA Regions 8, 9, and 10 who work directly on numeric nutrient criteria development.

We are convening state, tribal, federal, and academic water quality scientists as a way of better understanding the current state of the scientific knowledge about the environmental impacts of nutrient pollution and to use that knowledge to catalyze future actions that can support state water quality management of nutrient pollution under the Clean Water Act. The goals of the workshop are three-fold: First, we seek to communicate and exchange scientific information on the latest nutrient pollution science and numeric nutrient criteria development activities. Second, we intend for these exchanges to lead to more in-depth technical discussions and experiences in specific issue areas. Third, we are designing the exchanges and discussions to lead to discrete action items that support future state and tribal efforts to develop nutrient criteria.

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As part of the workshop, we have organized a special session on estuarine and coastal waters with the purpose of providing state and tribal water quality scientists with the latest scientific findings addressing the relationship between nutrients and biological responses and processes. We hope workshop participants will benefit from the information presented by experts like you and learn about how to appropriately select nutrient sensitive endpoints, develop their targets and derive numeric nutrient criteria. We consider your work in Western estuaries, especially in the Yaquina Estuary, as pivotal in helping nutrient criteria developers understand the importance of spatial and seasonal variation in criteria development, how to incorporate in-situ observations as an approach to determine reference condition (i.e. self-referential approach), how to calculate targets to ensure persistence of seagrasses, and how to evaluate the protectiveness of established response criteria (e.g. DO and chl *a*). Likewise, we found your knowledge of tools and models, and the role of climate variability and local nutrients in coastal acidification important to communicate to workshop participants. As a result, we want to extend you an invitation to participate on a panel and interactive discussion on "Use and Applicability of Nutrient Models and Other Tools to Address Nutrient Pollution." Please feel free to let us know if you are available and whether and how your research can be used to inform the other topics included in our agenda.

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hotel reservation, which should help in limiting your expenses. In the coming weeks our contractor, Tetra Tech, will contact you to provide additional logistical information. Should you have any questions about your participation or logistics, please do not hesitate to contact either of us.

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Janice Alers-Garcia, Ph.D., U.S. EPA, Office of Water, Office of Science and Technology, Workshop Co-Chair

Dear Dr. Bilhimer:

On behalf of the U.S. Environmental Protection Agency, we are pleased to formally invite you to participate in a regional Numeric Nutrient Criteria Technical Workshop that is being held at EPA's Region 9 office in San Francisco, California, May 1-3, 2018. You are invited to provide your scientific expertise on nutrient source reduction strategies for the Puget Sound, development of nutrient targets for anthropogenic source assessments in coastal and estuarine waters, and the development of nutrient reference guidance criteria for lake sin the state of Washington. You will be joined by our state, tribal, federal, and academic colleagues from across EPA Regions 8, 9, and 10 who work directly on numeric nutrient criteria development.

We are convening state, tribal, federal, and academic water quality scientists as a way of better understanding the current state of the scientific knowledge about the environmental impacts of nutrient pollution and to use that knowledge to catalyze future actions that can support state water quality management of nutrient pollution under the Clean Water Act. The goals of the workshop are three-fold: First, we seek to communicate and exchange scientific information on the latest nutrient pollution science and numeric nutrient criteria development activities. Second, we intend for these exchanges to lead to more in-depth technical discussions and experiences in specific issue areas. Third, we are designing the exchanges and discussions to lead to discrete action items that support future state and tribal efforts to develop nutrient criteria.

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Given your experience in the Washington State Department of Ecology Water Quality Program, we are pleased to invite you to share your knowledge on the scientific basis underlying nutrient management and its potential implications on criteria threshold development with workshop attendees. We have scheduled for you to participate in the special session on Estuaries and Marine Waters. We would like to learn about the "Puget Sound Nutrient Dynamics and Source Reduction Project" (e.g. what type of data has been collected to describe the relationship between nutrient-related parameters and their adverse effects on the estuary's ecology, what tools were used to identify anthropogenic nutrient sources, to set up target reductions and how will the effectiveness of the adopted reduction strategies be evaluated). Most participants might be interested to learn about the relationships between nutrients/ nutrient sources and response parameters in the estuary, as these might be able to inform their selection of endpoints and targets for nutrient criteria development, as well as alternatives to data collection and analysis. Therefore, we will appreciate your insight on how the work done on Puget Sound may inform state and tribal efforts to implement effective nutrient reduction strategies and/or developing numeric nutrient criteria. As a follow up to your experience with the aforementioned project as well as TMDL development, you are also invited to participate in a panel and interactive discussion on "Use and Applicability of Nutrient Models and Other Tools to Address Nutrient Pollution." As soon as we hear from other's panelist availability, we will make sure to set a meeting to discuss the approach and questions to be presented to all.

Chad Brown mentioned that you might be able to offer a presentation on “Washington’s Reference Guidance Criteria” during the workshop’s Lakes and Reservoir Session. We are looking forward to set up a time to discuss specifics. In the meantime, we will appreciate to hear how your work can be used to inform the other topics included in our agenda.

We are pleased to extend travel support to you as a way of facilitating your participation. Due to meeting space limitations we ask that no more than one (1) additional person from your organization accompany you to the workshop, although resource limitations preclude us from supporting their travel. In the coming weeks you will be contacted by our contractor, Tetra Tech, to begin planning your travel. Should you have any questions about your participation or travel, please do not hesitate to contact either of us.

As a trusted colleague, we appreciate your consideration to participate and look forward to your contributions to these important issues.

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Janice Alers-Garcia, Ph.D., U.S. EPA, Office of Water, Office of Science and Technology, Workshop Co-Chair

Dear Dr. Mazor:

On behalf of the U.S. Environmental Protection Agency, we are pleased to formally invite you to participate in a regional Numeric Nutrient Criteria Technical Workshop that is being held at EPA's Region 9 office in San Francisco, California, May 1-3, 2018. You are invited to provide your scientific expertise on numeric nutrient criteria development, as well as nutrient pollution science in general. You will be joined by our state, tribal, federal, and academic colleagues from across EPA Regions 8, 9, and 10 who work directly on numeric nutrient criteria development.

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STILL HAVE NOT WORK ON THESE....

Dear Dr. Cloern:

- Jim Cloern- Known for his work on WQ San Francisco Bay), but has conducted research in lakes, streams, and estuaries. Jim has done really interesting work tying nutrients species and algal growth to estuary dynamics. He can be a great resource for a breakgroup session on basic monitoring -for example, what type of monitoring best describes what is going on in an estuary in terms of eutrophication and algal dynamics?

<https://sfbay.wr.usgs.gov/access/wqdata/overview/people/jim.html>

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Dear Dr. Anna Michalak,

Our research focuses primarily on two areas. We are interested in understanding the cycling and emissions of greenhouse gases at the Earth surface at urban to global scales – scales directly relevant to informing climate and policy – primarily through the use of atmospheric observations that provide the clearest constraints at these critical scales. We are also interested in climate change impacts on freshwater and coastal water quality via influences on nutrient delivery to, and on conditions within, water bodies. Our approach is highly data-driven, with a common methodological thread being the development and application of spatiotemporal statistical data fusion methods for optimizing the use of limited in situ and remote sensing environmental data.

Department of Global Ecology
Carnegie Institution for Science
260 Panama St.
Stanford, CA 94305
email: michalak@carnegiescience.edu

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